

February 2, 2000

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Suisun Marsh Monitoring Program Channel Water Salinity Report for December 1999

The California Department of Water Resources is required to provide monthly channel water salinity compliance reports for the Suisun Marsh to the State Water Resources Control Board (SWRCB). This reporting requirement is based on SWRCB Water Rights Decision 1641 dated December 29, 1999 and previous SWRCB decisions.

I have attached a copy of *Suisun Marsh Monitoring Program Channel Water Salinity Report for December 1999*. The report includes data summaries and comparisons of the data with salinity standards. The report also includes a general discussion of water salinity conditions in the Marsh.

Please contact me at (916) 227-2727 or lcook@water.ca.gov if you have any questions.

Sincerely,

ATTACHMENT

Suisun Marsh Monitoring Program Channel Water Salinity Report for December 1999

Background

Conditions affecting channel water salinity levels in the Suisun Marsh include Delta outflow, rainfall and local creek inflow, managed wetlands operations, and operation of the Suisun Marsh Salinity Control Gates (SMSCG). Evaporation may also affect salinity levels in some areas of the Marsh, especially during summer months.

State Water Resources Control Board (SWRCB) Order WR 98-6, issued September 25, 1998, authorizes DWR to experimentally test the effects of modified flashboards at the SMSCG on salmon behavior. The modifications include gaps between adjacent flashboards. When in place, these modified flashboards tend to allow channel salinity levels in the Marsh to rise somewhat higher than when the original flashboards are used. Experimentation with the modified flashboards began in October 1998 and may continue periodically through May 2001.

Channel water salinity standards (Table 1), expressed as specific electrical conductivity (SC), are specified in SWRCB Water Rights Decision 1641 for five compliance monitoring stations within and near the Suisun Marsh (Figure 1). Four of these -- National Steel (S-64), Beldon's Landing (S-49), Volanti (S-42), and Sunrise (S-21) -- are located in the northern and eastern portions of the Suisun Marsh. Another, Collinsville (C-2), is located just east of the Marsh in the western Delta. Two other stations, Morrow Island (S-35) and Ibis (S-97), located in the western Marsh are monitoring stations only, however, data from these are included in this report for information purposes.

Compliance with SWRCB channel salinity standards for the Suisun Marsh is determined at the end of each month by comparison of the monthly mean SC level at high tide for each compliance monitoring station with the standard. The progressive monthly mean SC is used to trace salinity conditions during each month. The progressive mean is calculated for each station by averaging mean SC at high tide for a given day and all previous days that month. New progressive mean calculations begin at the start of each month.

Results and Discussion

Salinity standards were met at all compliance monitoring stations during the reporting period (Table 1 and Figure 2).

Delta outflow increased during parts of December 1999 over outflow in November (Figure 3). The monthly mean Net Delta Outflow Index (NDOI: the estimated average daily rate of outflow from the Delta) for December was calculated at 10,811 cubic feet per second (cfs) compared to 6,904 cfs in November. The NDOI was, however, relatively low for December compared to recent years (e.g. December 1998 NDOI = 47,052 cfs, December 1997 NDOI = 14,522 cfs).

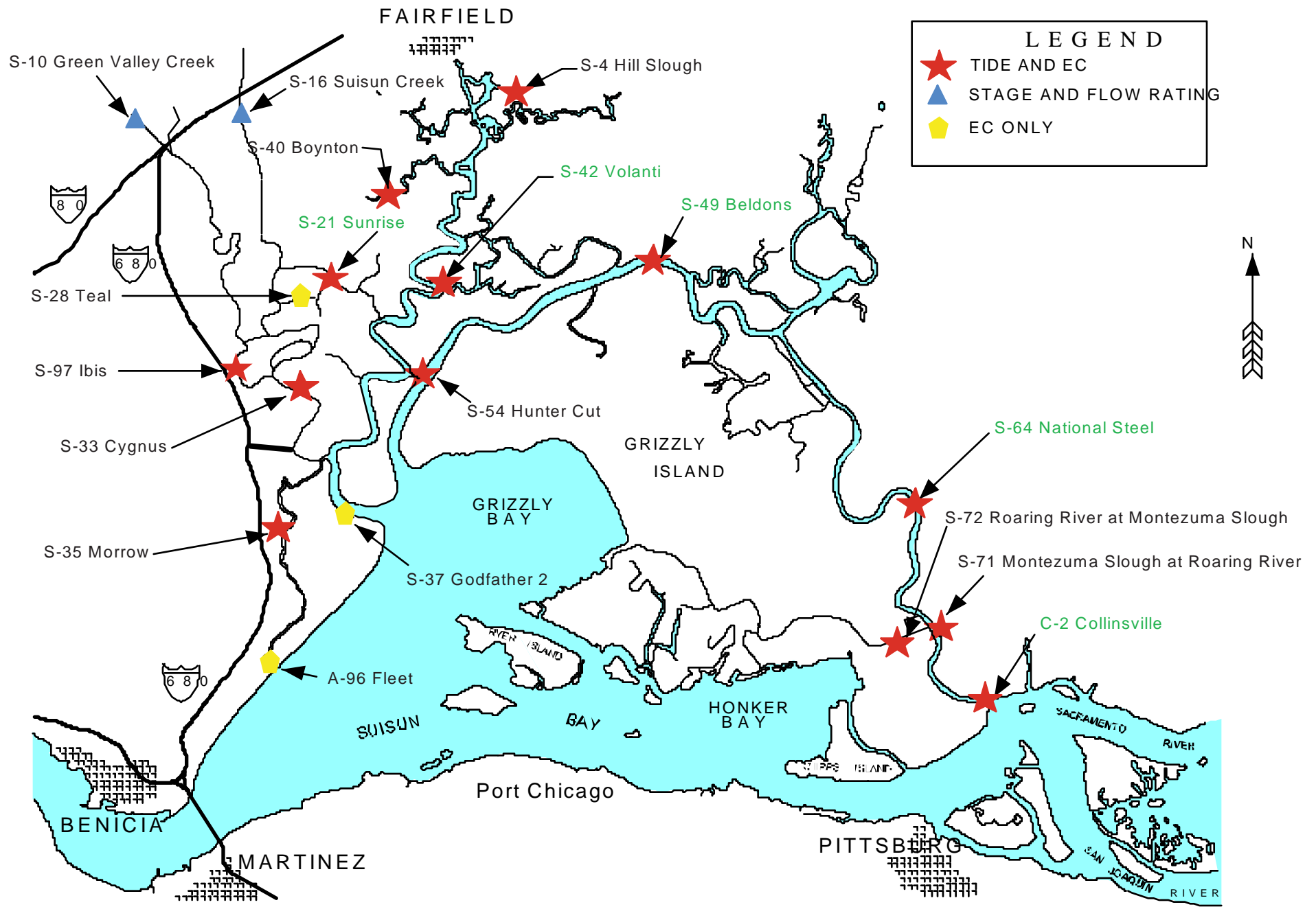
The SMSCG was operated with the modified flashboards from November 10 through December 9, 1999. The modified flashboards were left in place for the remainder of the month but gate operation was stopped on December 10, 1999 and the gates were allowed to remain open.

Total rainfall at the Waterman Gauging Station in Fairfield was seasonally low for December, measuring 0.52 inches.

Channel salinity levels in the Marsh during December were mostly a function of Delta outflow and SMSCG operation. Gate operation from November 10 through December 9, 1999 and increases in Delta outflow kept high tide salinity levels relatively constant. Decreasing high tide salinity at C-2 was mostly a result of increases in Delta outflow during the first half of the month. Decreasing Delta outflow in the second part of December probably caused the small increases in high tide salinity recorded at S-64 and S-49 during that time.

Monthly mean SC at high tide at the five compliance monitoring stations and at monitoring stations S-35 and S-97 in December, were compared with means for the previous nine years (Figure 4). The monthly mean SC at high tide during December 1999 was higher at all of the above stations compared to those of the previous 4 years. This was probably due to the lack of seasonal rainfall and relatively small Delta outflow.

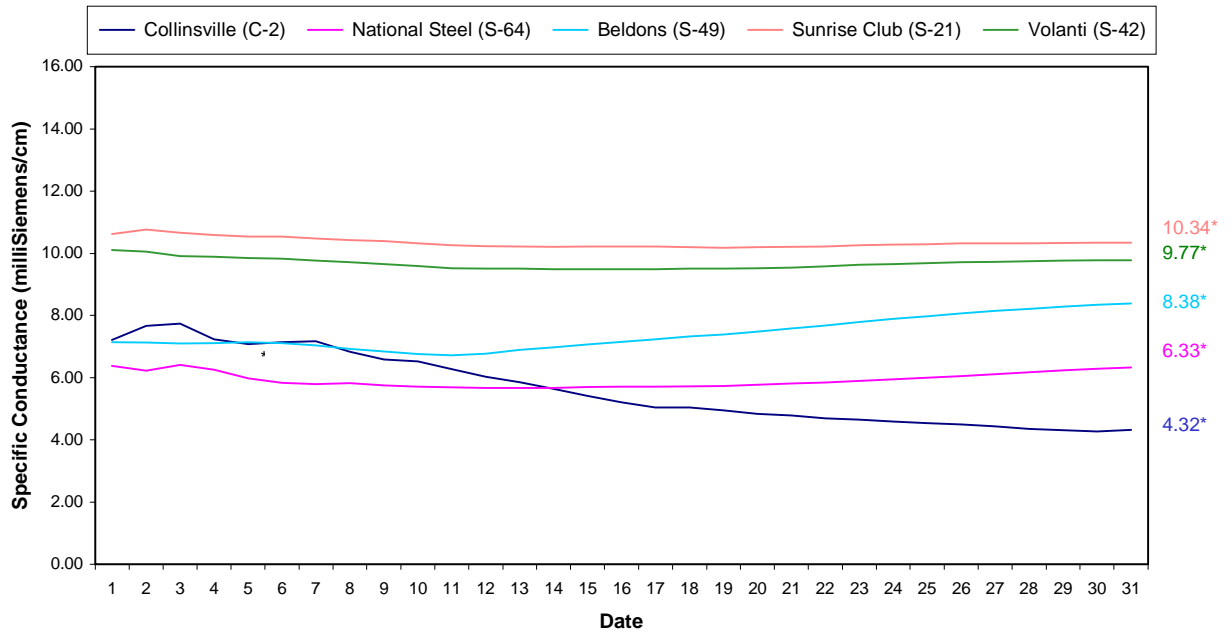
Figure 1. Suisun Marsh continuous compliance monitoring and other monitoring stations. Compliance monitoring stations are indicated by green type.



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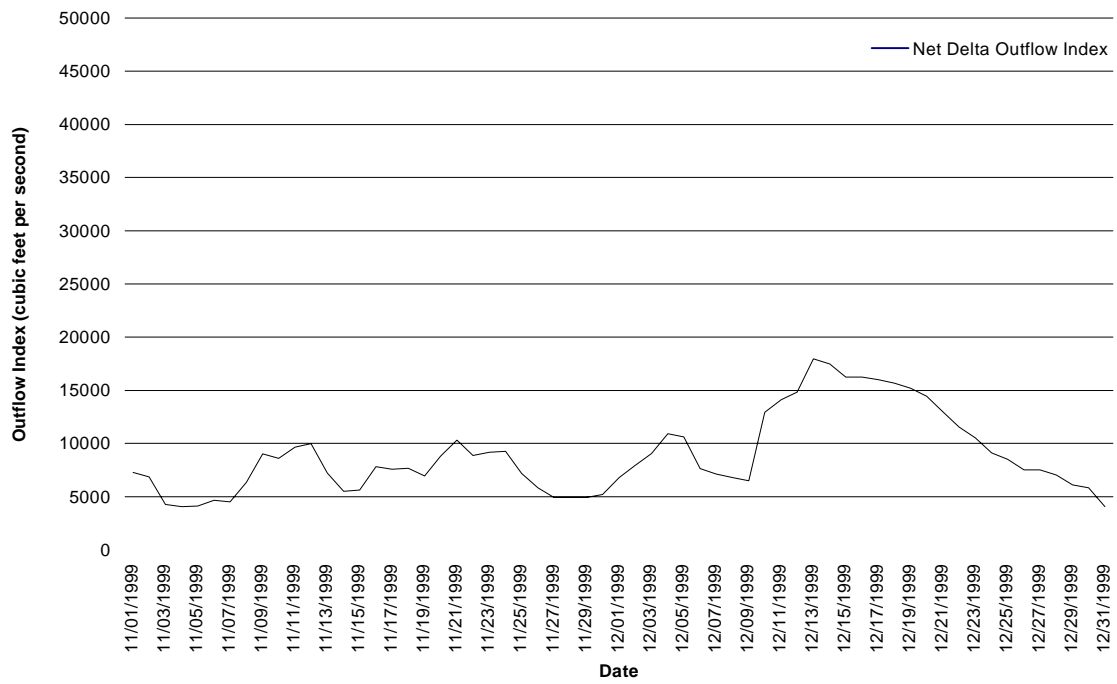
**Figure 2. Suisun Marsh Calendar Month Progressive Mean
of the Specific Conductance at High Tide
December 1999**

Standard = 15.5 mS/cm

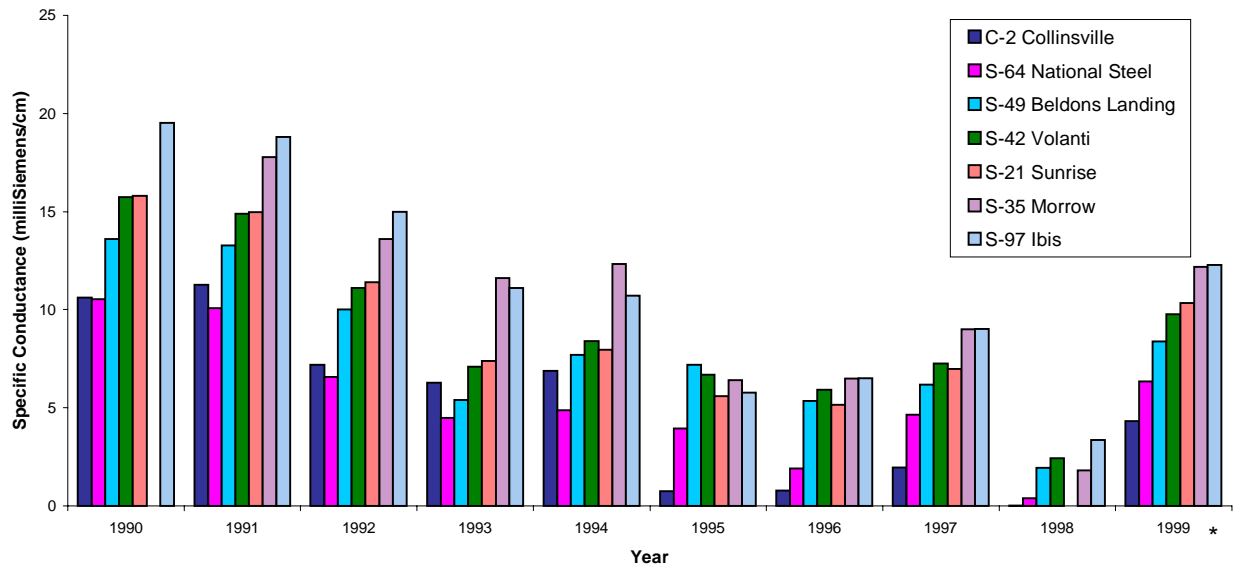


* = monthly mean specific electrical conductance at high tide.

Figure 3. Net Delta Outflow Index for December 1999



**Figure 4. Mean Monthly Specific Conductance at High Tide:
Comparison of Monthly Values for Selected Suisun Marsh Compliance Stations
December 1990-1999**



* Tide measurements at S-97 ceased in mid October 1999 due to station subsidence problems. Station S-33 is located a short distance downstream of S-97. Tidal cycle comparisons between these stations prior to October 1999 showed that tidal stage timing is closely similar. For this reason, tide measurements at S-33 were used here to predict the timing of high tide at S-97.